BATTERY CALCULATIONS
FAP–001–58

ITEM	DESCRIPTION	QTY	STANDBY CURRENT PER ITEM (AMPS)	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP–35	FACP w/2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS–35	POWER SUPPLY	2	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
PM–31	MATRIX MODULE	1	0.0000	0.0000	0.0000	0.0000
SM–30	SWITCH MODULE	1	0.0000	0.0000	0.0450	0.2700
SR–30	2 RELAY MODULE	1	0.0000	0.0000	0.0450	0.0450
SR–32	6 RELAY MODULE	2	0.0000	0.0000	0.0450	0.0900
ZN–34US	SUPERVISORY MODULE	1	0.0100	0.0100	0.1100	0.1100
ZU–35	ZONE MODULE	3	0.0090	0.0270	0.1100	0.3300
ZU–35DS	ZONE MODULE/SD's	4	0.0090	0.0360	0.1100	0.4400
SMOKE	SMOKE DETECTOR	15	0.0001	0.0015	0.0010	0.0150
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	2	0.0020	0.0040	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						1.9400
	TOTAL SYSTEM CURRENT		STANDBY	0.4565	ALARM	3.7210

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) +
(TOT. ALARM CURRENT X ALARM TIME)} X 1.25
MIN. BATTERY CAPACITY = {(0.4565 A X 24 HR) + (3.721 A X 0.083 HR)} X 1.25
MIN. BATTERY CAPACITY = {10.9560 AHr + 0.3088 AHr} X 1.25 = 14.0811 AHr

NOTIFICATION APPLIANCE CIRCUIT
VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1: 58 & 58A DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd	–	0.5010	0.0000
WHEELOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELOCK STROBE 30 cd	–	0.0300	0.0000
WHEELOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELOCK STROBE 75 cd	–	0.0210	0.0000
WHEELOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELOCK STROBE 110 cd	7	0.2200	1.5400
WHEELOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELOCK HORN	–	0.0000	0.0000
AUTOCALL BELL	8	0.0500	0.4000
TOTAL NOTIFICATION APPLIANCES CURRENT			1.9400

VOLTAGE DROP (VD) CALCULATIONS
VD = {(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = A CONSTANT
CM = CIRCULAR MILS
VD = {(1.94A) (250FT) (21.64)}/4110 = 2.549V
%VD = {2.549V / 24V} X 100 = 10.62%
REMAINING VOLTS = 21.451

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

FIRE ALARM SYSTEM FUNCTION CHART

SYSTEM EVENT / RESPONSE	ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE NOTIFICATION APPLIANCES	AHU-2 SHUTDOWN
58, 58A FIRE CALL BOXES	●	●			●	
58, 58A HEAT DETECTORS	●	●			●	
58, 58A, 58BSMOKE DETECTORS	●	●			●	
58, 58A, 58B FIRE SPRINKLER WATERFLOW SWITCHES	●	●			●	
ROOF SMOKE DETECTOR	●	●			●	●
58, 58A, 58B FIRE SPRINKLER VALVE SUPERVISORY SWITCHS	●			●		
AC POWER FAILURE	●		●			
SYSTEM FAULT	●		●			

_	LDD	LDD	MCD	09/24/13	AS BUILT	
REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS	

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)

AS BUILT
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09/24/13

BLDG 58, 58A FIRE ALARM
FUNCTION CHART & CALCULATIONS
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DRAWN BY LDD	DATE 9/24/2013
CHECKED BY LDD	9/24/2013
APPROVED BY MCD	9/24/2013
SCALE AS NOTED	

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWING NO. 4B58E079_
PROJECT NO. 000000
SHEET 1 OF 1